



## **RESEARCH DEPARTMENT**

**BAND III EXPERIMENTAL TRANSMISSIONS FROM WENVOE**

**Report No. K-115**

**( 1958/28 )**

**THE BRITISH BROADCASTING CORPORATION  
ENGINEERING DIVISION**

RESEARCH DEPARTMENT

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(1956/28)

B. Davis

A handwritten signature in dark ink, appearing to read "W. Proctor Wilson". The signature is written in a cursive style with a horizontal line underneath the name.

(W. Proctor Wilson)

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BAND III EXPERIMENTAL TRANSMISSIONS FROM WENVOE

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September 1956

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## BAND III EXPERIMENTAL TRANSMISSIONS FROM WENVOE

### SUMMARY

A field strength survey was made in Wales and the West of England to determine the extent of the area that could be served by a Band III television transmitter at Wenvoe having an e.r.p. of 100 kW. It was found that large areas of Swansea and Bristol would receive field strengths less than  $500 \mu\text{V/m}$  and it is concluded that no single transmitter with an e.r.p. of 100 kW could be sited in Wales to give both Swansea and Bristol a fully satisfactory service.

### 1. INTRODUCTION.

In a plan for second B.B.C. programme coverage in the United Kingdom on Band III it had been proposed that one transmitter should be sited at Wenvoe.

To determine the service area of such a transmitter an experimental low power transmitter was installed at Wenvoe. The transmitting aerial was mounted on the existing 750 ft (229 m) mast at a height of 600 ft (183 m) above ground level and radiated a vertically polarised transmission with an e.r.p. of 300 watts.

The field strength measuring equipment and technique was the same as that used on a similar survey at Holme Moss and discussed in Research Department Report No. K-111.

All field strengths quoted in this report are for an e.r.p. of 100 kW and for a receiving aerial height of 30 ft (9.2 m) above ground level.

### 2. RESULTS.

Fig. 1 is a map of the whole area showing the positions of the median field strength contours from 50 mV/m to 0.1 mV/m. This map is based on measurements in towns and villages and the field strength in open country is likely to be in excess of the values indicated by the map. The actual median value in any particular town or village would lie within  $\pm 10$  dB of that shown.

The range of variations in any town can be obtained from Table 1.

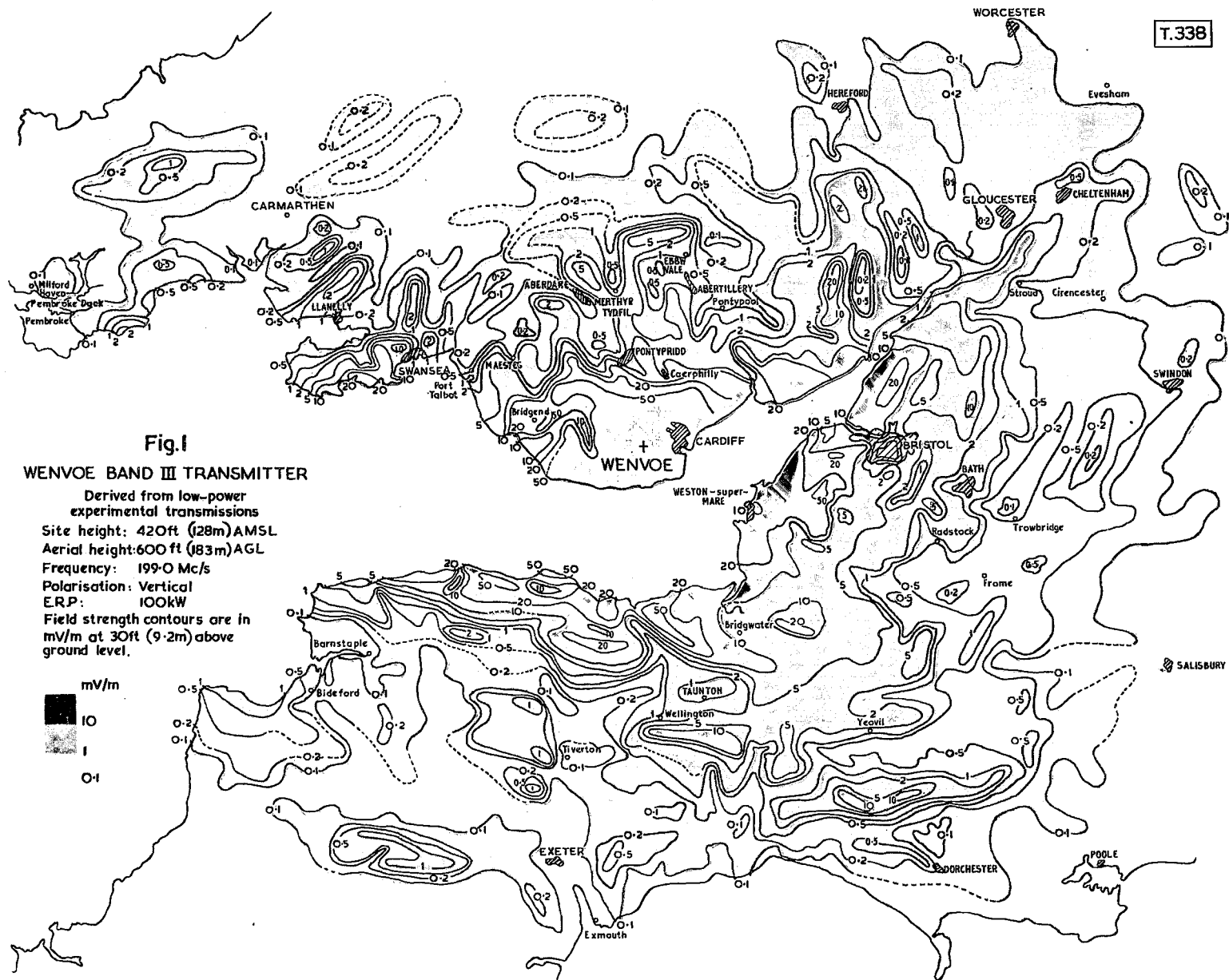


TABLE 1

Field Strength in mV/m at 30 ft (9.2 m) A.G.L.

E.R.P. 100 kW

## South Wales

Town	Max.	Median	Min.
Aberaman	1.5	0.4	0.2
Aberdare	2.0	0.26	<0.1
Abergavenny	0.7	0.1	<0.1
Abersychan	2.0	0.3	<0.1
Abertillery	4.5	0.6	0.12
Ammanford	0.25	<0.1	-
Beaufort	5.0	0.9	0.15
Brecon	0.55	<0.1	-
Bridgend	200	45	2.0
Brynmawr	4.0	1.3	0.4
Builth Wells	<0.1	-	-
Burry Port	5.0	1.2	0.45
Caerleon	15	6.0	1.8
Caerphilly	35	3.5	0.7
Cardiff	>2000	210	12
Carmarthen	<0.1	-	-
Chepstow	30	0.75	0.15
Cowbridge	100	6.5	2.0
Crickhowell	0.15	<0.1	-
Cwm-bran	7.0	2.8	1.0
Ebbw Vale	3.0	0.5	0.1
Haverfordwest	0.2	<0.1	-
Hirwaun	0.3	0.14	<0.1
Kidwelly	0.65	0.13	<0.1
Llandilo	<0.1	-	-
Llandoverly	<0.1	-	-
Llanelly (Centre)	0.45	0.13	<0.1
(East)	0.6	0.14	<0.1
(South)	0.7	0.28	0.13
(North)	1.0	0.26	0.1
(South-east)	3.0	0.9	0.3
Loughor	1.4	0.28	0.08
Maesteg	30	1.4	0.45
Merthyr Tydfil (West)	2.0	0.45	0.16
(South)	1.5	0.28	0.13
(Centre)	1.5	0.38	0.15
(North-east)	3.0	0.65	0.28
Milford Haven	0.4	<0.1	-
Monmouth	4.0	1.1	0.25
Mountain Ash	3.5	1.6	0.55
Narberth	0.2	<0.1	-
Neath	0.6	0.14	<0.1
Newport	200	16	0.6
Neyland	0.5	0.12	<0.1
Pembroke	0.2	<0.1	-
Pembroke Dock	0.2	<0.1	-
Pontardulais	0.4	<0.1	-
Pontypool	1.5	0.13	<0.1
Pontypridd	10	2.5	0.5
Porthcawl	45	9.5	2.2
Port Talbot (North-west)	1.5	0.12	<0.1
(Centre)	0.27	<0.1	-
(South)	5.0	0.7	0.1
(East)	0.5	0.11	<0.1
Rhymney	5.0	0.75	0.2
Risca	15	2.0	0.8
Ross-on-Wye	4.5	0.45	<0.1
St. Clears	0.2	<0.1	-
Swansea (See Fig. 2)			
Talgarth	<0.1	-	-
Tenby	5.0	0.45	0.14
Tonypandy	6.0	1.8	0.5
Tonyrefail	35	4.0	1.0
Tredegarr	1.0	0.3	0.1
Treforest	10	5.0	1.0
Treharris	6.0	1.2	0.25
Treherbert	1.7	0.75	0.4

## South Wales (Cont'd)

Town	Max.	Median	Min.
Treorky	6.0	1.0	0.4
Tyntetown	7.0	2.3	1.0
Usk	5.5	1.5	0.3
Ystrad Rhondda	3.0	0.7	0.2

## South-west England

Axbridge	2.5	0.4	0.1
Axminster	0.4	<0.1	-
Bampton	0.3	<0.1	-
Barnstaple (South-east)	0.22	0.1	<0.1
(South-west)	0.8	0.23	<0.1
(Centre)	<0.1	-	-
(North)	<0.1	-	-
Bath (North)	15	1.1	0.22
(North-west)	5.0	0.7	0.15
(Centre)	0.7	0.3	0.13
(West)	4.5	0.5	0.18
(South-west)	4.0	1.0	0.18
(East)	28	4.0	0.3
(South)	2.2	0.65	0.2
Beaminster	2.0	0.7	0.26
Bideford	0.25	0.1	<0.1
Blandford Forum	0.5	0.1	<0.1
Bradford on Avon	0.4	<0.1	-
Bridgwater (West)	30	9.0	2.0
(South)	13	5.5	1.5
(Centre)	12	4.0	1.5
(East)	15	5.0	2.2
Bridport	0.4	0.1	<0.1
Bristol (See Fig. 3)			
Broadway	0.25	0.1	<0.1
Bromyard	0.25	<0.1	-
Bruton	0.7	0.21	<0.1
Burford	0.2	<0.1	-
Burnham-on-Sea	28	15	6.0
Calne	0.5	0.11	<0.1
Castle Cary	40	4.5	0.8
Cerne Abbas	1.5	0.28	0.11
Chard	1.0	0.38	0.18
Cheddar	3.0	1.1	0.4
Cheltenham (East)	0.6	0.25	0.1
(Centre)	0.15	<0.1	-
(South)	0.6	0.25	<0.1
(West)	0.35	0.13	<0.1
Chippenham	0.55	0.13	<0.1
Chipping Sodbury	30	6.0	2.0
Chudleigh	<0.1	-	-
Chulmleigh	0.25	<0.1	-
Cinderford	5.5	1.6	0.5
Cirencester	0.35	0.11	<0.1
Clevedon	150	28	3.0
Colyton	<0.1	-	-
Combe Martin	2.5	0.1	<0.1
Crediton	<0.1	-	-
Crewkerne	4.5	0.7	0.28
Cricklade	0.35	0.15	<0.1
Cullompton	0.5	0.12	<0.1
Dawlish	<0.1	-	-
Devizes	2.5	0.65	0.22
Dorchester	0.4	0.1	<0.1
Dulverton	0.3	<0.1	-
Dursley	3.0	0.5	0.15
Evesham	0.1	<0.1	-
Exeter	0.2	<0.1	-
Exmouth	<0.1	-	-
Fairford	0.18	<0.1	-
Faringdon	0.4	<0.1	-
Frome	1.0	0.2	<0.1
Gillingham	0.6	0.2	<0.1



## South-west England (Cont'd)

Town	Max.	Median	Min.
Glastonbury	40	9.0	2.0
Gloucester (North)	0.3	0.1	<0.1
(Centre)	0.25	0.11	<0.1
(South)	1.0	0.15	<0.1
(South-east)	0.55	0.18	<0.1
(North-east)	0.3	0.13	<0.1
Great Malvern	0.2	<0.1	-
Great Torrington	<0.1	-	-
Hatherley	<0.1	-	-
Hereford	0.6	0.1	<0.1
Highworth	1.1	0.7	0.2
Holsworthy	0.15	<0.1	-
Honiton	0.4	<0.1	-
Ilchester	3.0	1.1	0.6
Ilfracombe (South)	5.0	1.3	0.7
(Centre)	10	3.5	0.8
(North-east)	30	5.5	1.2
Ilminster	5.0	0.65	0.2
Keynsham	2.5	0.65	0.28
Kilhampton	0.28	<0.1	-
Langport	6.0	2.2	0.6
Lechlade	0.3	0.14	<0.1
Ledbury	1.5	0.27	0.11
Lydney	2.0	0.35	<0.1
Lyme Regis	<0.1	-	-
Lynmouth	85	20	6.0
Lynton	100	25	6.0
Maiden Newton	0.4	0.13	<0.1
Malmesbury	3.0	0.28	<0.1
Marlborough	0.35	<0.1	-
Martock	10	2.3	1.0
Melksham	1.5	0.55	0.25
Mere	0.15	<0.1	-
Milborne Port	1.0	0.23	0.1
Milverton	1.5	0.17	<0.1
Minehead	80	14	3.0
Moretonhampstead	<0.1	-	-
Nailsworth	0.4	0.22	0.1
Okehampton	0.7	0.12	<0.1
Ottery St. Mary	0.8	0.2	<0.1
Pershore	0.25	<0.1	-
Pewsey	0.35	<0.1	-
Poole	0.15	<0.1	-
Porlock	30	4.0	0.7
Portishead	5.0	1.8	0.6
Radstock	4.0	0.7	0.12
Salisbury	<0.1	-	-
Shaftesbury	6.0	0.5	0.12
Shepton Mallet	1.5	0.3	<0.1
Sherborne	0.7	0.18	<0.1
Somerton	20	3.0	1.0
South Molton	0.5	<0.1	-
Stalbridge	1.2	0.18	<0.1
Stow-on-the-Wold	0.6	0.22	<0.1
Stroud	4.5	0.8	0.18
Sturminster Newton	1.0	0.3	<0.1
Swindon (South)	1.0	0.2	<0.1
(West)	1.3	0.17	<0.1
(North)	0.45	0.18	<0.1
(Centre)	0.22	0.1	<0.1
(East)	0.4	0.13	<0.1
Taunton (East)	4.0	0.7	0.27
(North)	3.5	0.7	0.22
(Centre)	2.7	0.7	0.28
(West)	3.0	0.8	0.2
Tetbury	1.5	0.28	0.11
Tewkesbury	0.25	0.1	<0.1
Tiverton	0.2	<0.1	-
Topsham	0.17	<0.1	-
Trowbridge	0.4	0.12	<0.1
Uffculme	0.4	0.18	<0.1
Upton-upon-Severn	0.25	<0.1	-

## South-west England (Cont'd)

Town	Max.	Median	Min.
Wareham	0.1	<0.1	-
Warminster	1.0	0.3	0.1
Watchet	140	30	7.0
Wellington	2.8	0.85	0.35
Wells	7.0	0.6	0.2
Westbury	2.5	0.4	0.17
Weston-Super-Mare (East)	15	9.0	4.0
(Centre)	45	12	5.0
(South)	100	45	7.0
(North-east)	8.0	1.9	0.8
Westward Ho	1.0	0.45	0.23
Williton	35	10	3.0
Wilton	<0.1	-	-
Wimborne Minster	0.1	<0.1	-
Wincanton	1.0	0.28	0.1
Witheridge	1.0	0.3	<0.1
Wiveliscombe	1.3	0.23	<0.1
Wootton Bassett	2.0	0.9	0.35
Worcester	0.7	0.11	<0.1
Wotton Under Edge	10	2.2	0.8
Yeovil	2.5	0.22	0.1

Referring to Fig. 1, it will be seen that most of the populated area of South Wales would be within the 0.5 mV/m contour, although certain areas, particularly the Swansea valley and the Neath/Port Talbot area, would be outside this contour. Large areas of Monmouthshire are also outside the 0.5 mV/m contour.

The service in the West of England is limited by Exmoor in North Devon but most of Somerset and the northern parts of Dorset lie within the 0.5 mV/m contour. Hill screening reduces the available median field strength in other parts of Dorset to values much below 0.1 mV/m.

To the east of the region the 0.5 mV/m contour extends to include Bath, but further east the fields over a large area are reduced to values between 0.5 and 0.1 mV/m.

Detailed measurements were made in Swansea and Bristol, as shown in Figs. 2 and 3 respectively. The contours show the median values of field strength and the accuracy of the measurements is such that actual values in any locality will be within  $\pm 6$  dB of the value indicated.

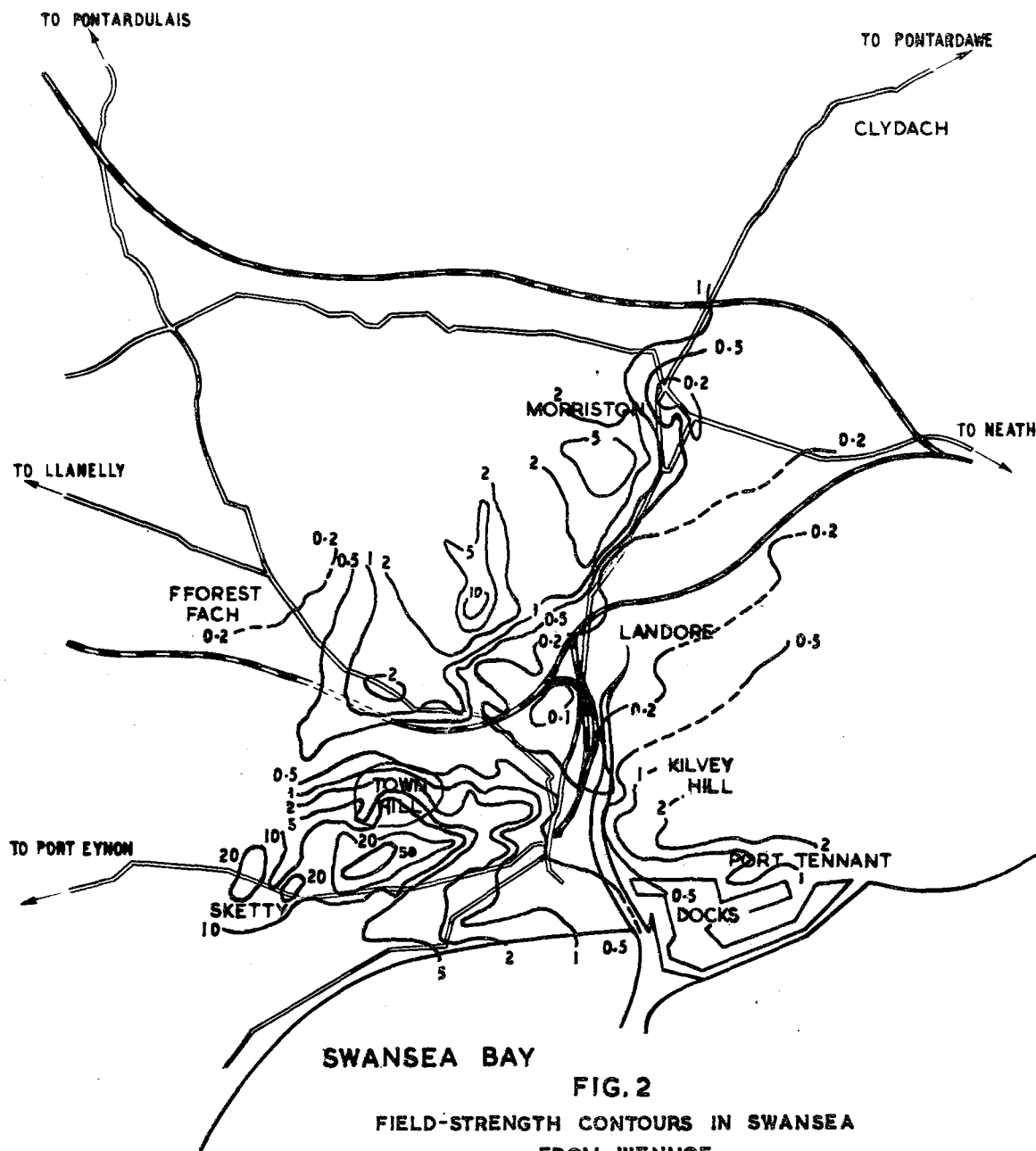
It will be seen that parts of Swansea and Bristol would receive a median value of less than 0.5 mV/m, that is, outside the limit of an acceptable service on Band III. In Swansea there are some areas even below 0.1 mV/m, and in Bristol the lowest contour is 0.2 mV/m. In these areas no service can be expected.

In both these towns there are areas in which Band III field strength would be less than is at present being received from Wenvoe on Band I for the same e.r.p.

No detailed contour map of the measurements in Cardiff has been drawn, but the maximum, median and minimum field strength values are shown in Table 1.

## SWANSEA

T.326



Derived from low-power experimental transmissions

Site height: 420 ft. (128m) AMSL

Aerial height: 600 ft. (183m) AGL

E.R.P.: 100 kW

Frequency: 199.0 Mc/s

Polarisation: Vertical

Field strength contours are in  
mV/m 30ft. (9.2m) above ground  
level.

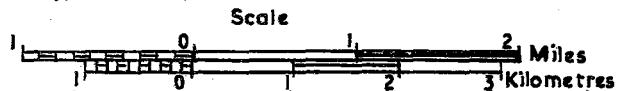
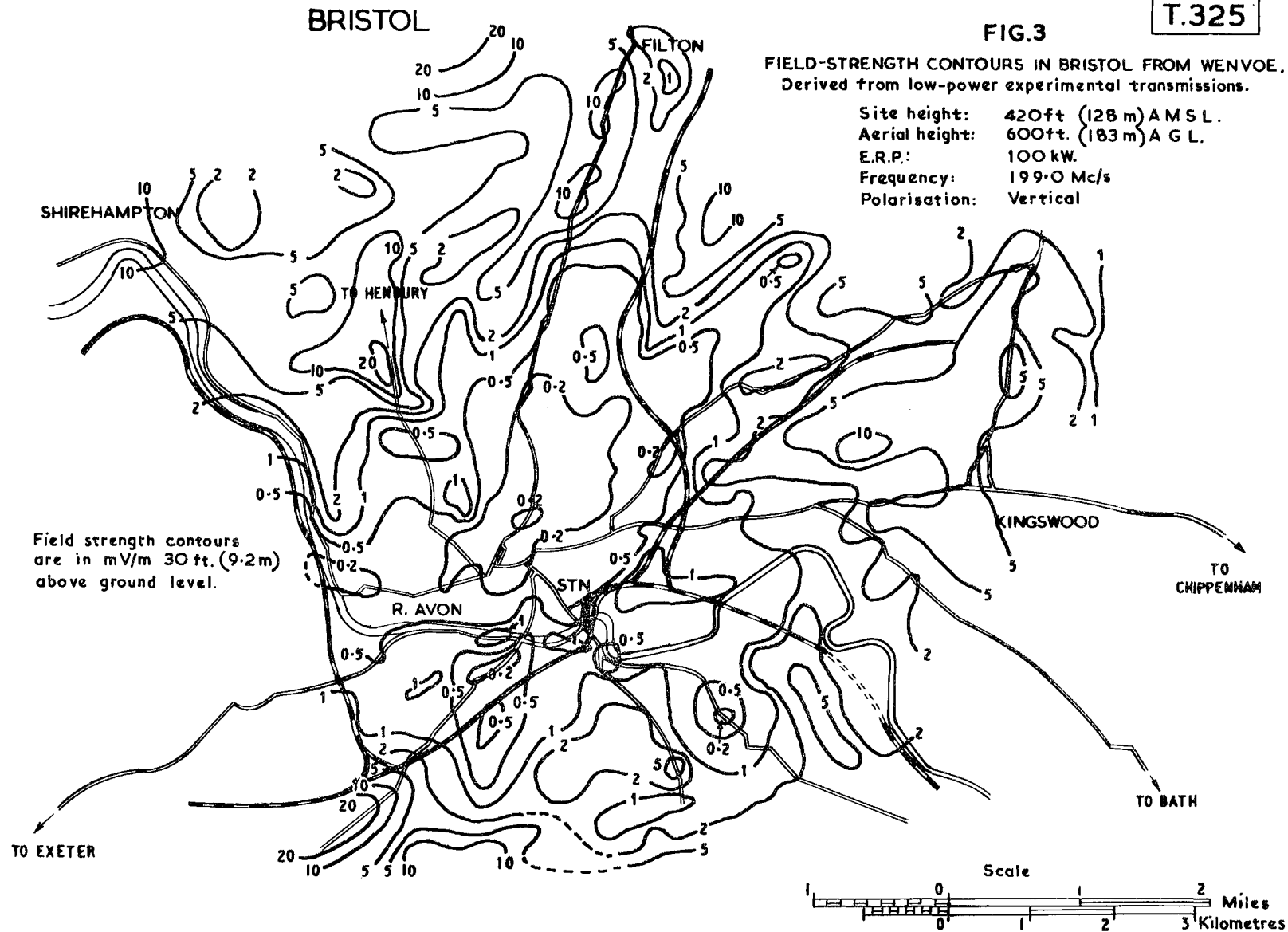


FIG.3

FIELD-STRENGTH CONTOURS IN BRISTOL FROM WENVOE.  
Derived from low-power experimental transmissions.

Site height: 420ft (128 m) AMSL.  
Aerial height: 600ft. (183 m) AGL.  
E.R.P.: 100 kW.  
Frequency: 199.0 Mc/s  
Polarisation: Vertical



### 3. CONCLUSIONS.

A Band III television transmitter sited at Wenvoe with an e.r.p. of 100 kW would probably supply the best overall coverage. Parts of Swansea and Bristol will have no service, or at best only a poor service, even if high gain aerials are used.

It is unlikely that a transmitter at any other site would give a better service in both Bristol and Swansea. An improvement in the service to Swansea would possibly be achieved with perhaps little deterioration to the service in Bristol if a site on the Quantock Hills were used. The field strength in the industrial valleys of South Wales from such a site would be seriously reduced and the overall area coverage might be worse than from Wenvoe.